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The Air Line Pilot

April, 1955

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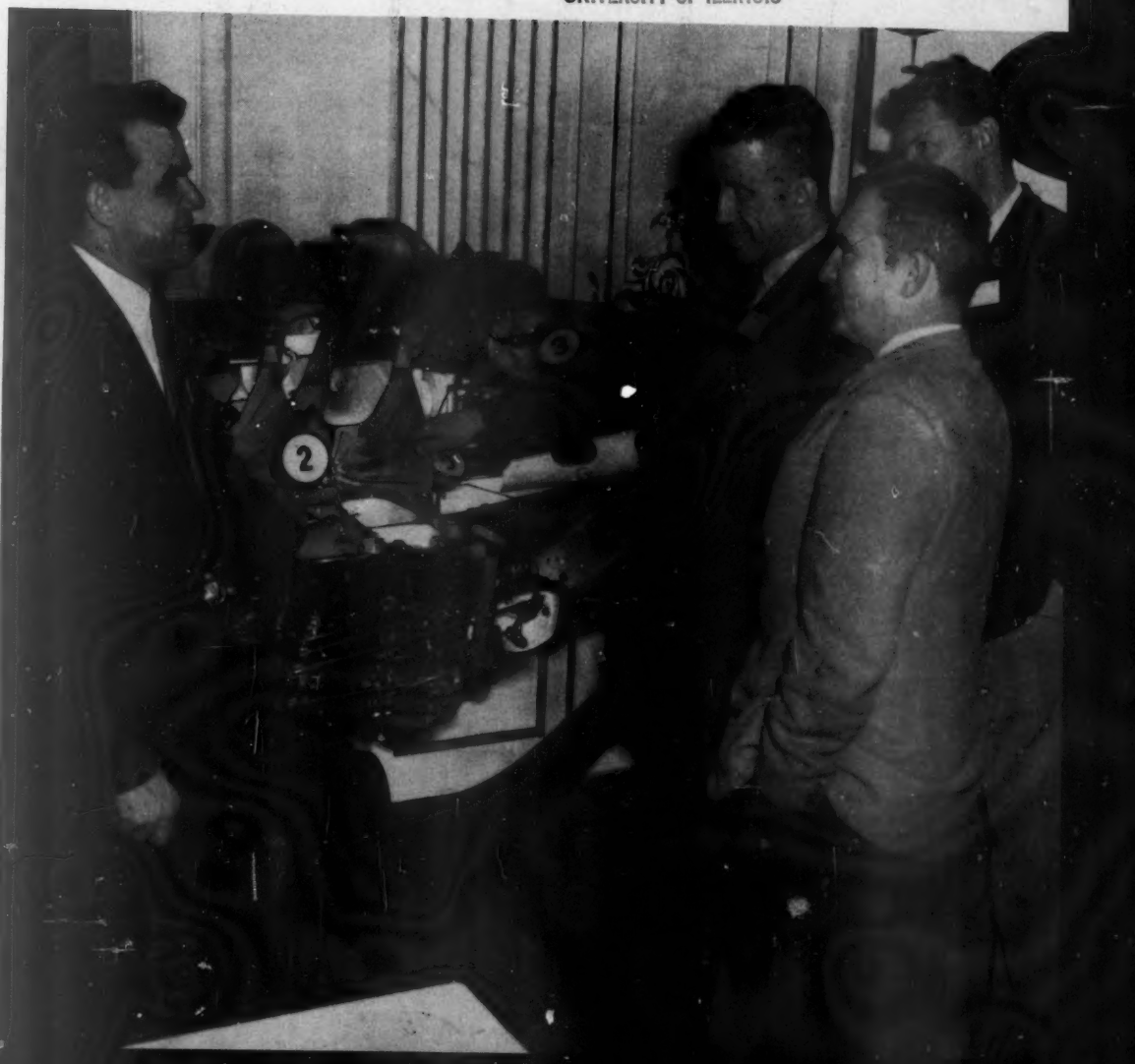

Air Safety Forum —Page 2—

The ALPA Air Safety Forum

For three days pilot, industry and government representatives talked, ate and slept air safety. A report on the third ALPA Safety Forum.

By Ed Modes

Are our airports adequate, or what are they lacking?

Is pilot training really necessary?

What do we need before all-weather flying becomes a safe reality?

Is accident investigation and prevention keeping up with aviation technology?

How do operational and safety problems of the jet age compare with the piston-powered era?

A big order, the answer to those questions.

But in broad and general terms these were the fundamental questions around which the Third Annual ALPA Air Safety Forum, held at the Shoreland Hotel, Chicago, March 8, 9, and 10, revolved.

Approximately 150 delegates, guests and observers heard reports and participated in discussions of these important air safety questions during the three day meeting. Specifically the Agenda covered all-weather flying, pilot training, accident investigation and prevention, turbo prop transport operations, and ALPA's Safety Organization. Captain Homer Mouden (BNF) served as M.C.

The Goals

The overall goal of the Air Safety Forum was outlined by President Say-

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en of ALPA in a brief address opening the Forum.

These goals, Sayen said, were:

- First, to preserve our current level of safety.
- Then, to improve on what we have achieved.
- And next, to begin thinking about the problems of the future.

"This," Sayen told the Forum, "can be materially aided by the exchange of experience and knowledge, not only among pilots but among other people in the industry as well. We have much to learn from each other."

"The Air Safety Forum," he pointed out, "provides an opportunity to review our most critical current problems with the hope it will open up new ideas and thoughts and that the information coming from a free exchange of opinion will raise the general level of knowledge and stimulate additional activity.

Improvement sometimes comes hard, he cautioned: "It's not easy even to maintain the level of safety we have. We're continually introducing new hazards, as witness more traffic with resulting Air Traffic Control problems."

Of the future, he said: "Change is not necessarily progress. As pilots we must represent the most critical and conservative influence in the industry. We must retain our conservatism without retarding progress. We shouldn't resist things because they're new, but at the same time we must review them very critically to ascertain that they are really progress in the true sense and not merely change for change's sake."

He pinpointed the pilots' responsibility in the stimulation of progress: "Primarily pointing out and defining problems, even though we don't have the solution, so that these problems will be recognized and with that recognition work started toward their solution.

ALPA's SAFETY ORGANIZATION: More pilots actively participating will enlarge the scope of ALPA's air safety program.

ALL-WEATHER FLYING PANEL: Before all-weather flying is here more aids are needed both on the ground and in the cockpit.

"Most important of all," he concluded, "as pilots we must insist that safety be given its proper place in the industry and not let it become a stepchild."

ALPA's Activities

The first day of the Forum was devoted largely to reports on ALPA's Safety Organization.

T. G. Linnert, head of ALPA's Engineering and Air Safety Department, said that safer airport conditions is a prime goal at which ALPA must aim

(Continued on Page 9)

Vol. 24, No. 4

The Air Line Pilot

April, 1955

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Ed Modes, Editor

The Case for Local Air Service

Local service lines have done much with little but many problems road-block their full potential. One of the most basic: lack of permanent certificates.

The Air Line Pilots Association is very appreciative of the opportunity to appear before you today in support of the legislation which would provide permanent certification for local service air carriers.

The Air Line Pilots Association is an association of the professional air line pilots of the scheduled United States air carriers. At present it has a membership of over 12,000 active and inactive members employed by 41 certificated air lines. The Association represents air line pilots in all aspects of their professional life. It is their bargaining agent under the Railway Labor Act, maintains an extensive air safety organization in 116 Councils scattered throughout the United States and a number of foreign countries, and is spokesman for the air line pilot in his relationship with municipal, state, federal and international organizations. With specific reference to the local service carriers, the Association represents all of the pilots of the 14 temporarily certificated local service carriers. These individuals, along with stockholders, management, and other employees, have invested their professional future in the carriers who will be affected by this proposed legislation.

By way of personal background, I hold B.A. and M.A. degrees in geography and economics. I have been a teacher and an air line pilot. Some current activities include the Presidency of the International Federation of Air Line Pilots Associations which is a federation of the pilot representing organizations of some 22 countries; membership on the Committee on Operating Problems of the National Advisory Committee for Aeronautics, Executive Committee of the National Air Transport Coordinating Committee, War Air Service Pattern Committee of the Defense Air Transportation Administration, Civil Aviation Air Defense Advisory Committee, National Aviation Noise Reduction Committee, Civil Aeronautics Administration Prototype Aircraft Advisory Committee, Executive Committee of the Radio Technical Commission for Aeronautics, and the Chicago Aero Commission.

Competent witnesses who have appeared in behalf of permanent certification for the local service carriers have presented statistical evidence demonstrating the growth and development of this service. It would serve no purpose, therefore, to take the Committee's time in useless repetition. We would like, however, to present a few brief facts to demonstrate that these carriers perform an essential service in our economy and that this service is capable of sustained growth in the public interest. Without exception, the local service carriers have entered the scheduled air transportation field since the end of World War II. The oldest has been operating for slightly more than ten years, while the youngest is only four years old. In this relatively brief period, these carriers have developed a network of approximately 30,000 miles of air routes serving 440 communities in the United States. The only air service provided to 264 of these communities is by local service air carriers. Over 47 million people have air service made available to them by this new aviation enterprise.

Editor's Note:

Four important bills that would give permanent certification to Local Service carriers are before Congress in the 84th session. These bills are S.651, S.308, H.R. 2225 and H.R. 526.

The Board of Directors of the Association in the 13th Convention endorsed the permanent certification and urged that it be achieved as rapidly as possible.

ALPA, as part of its overall policy, has favored permanent certification for the Local Service carriers in the belief that these air lines perform an essential service in our economy and that this service is capable of sustained growth in the public interest.

Because of ALPA's strong interest in this legislation, the Association was asked to testify at Committee hearings on these bills in both the House and Senate. This is the text of ALPA President Sayen's testimony before those bodies.

Accepted Part of Economy

That local air service is an accepted and expanding part of our economy is evident from a few statistics. The revenue-ton-miles moved by local service air carriers increased from a figure of 202,000 in 1945 to 39,620,000 during the year 1953. The total commercial revenue, exclusive of mail pay, increased from approximately $5,000,000 in 1948 to $24,300,000 in 1953. The increase is continuing. While the so-called subsidy payments have increased during this period, a large portion of the increase has been due to the increase in the route miles of local air service being made available and additional communities being served.

More difficult to measure directly is the contribution which has been made to the communities being given air service by these carriers. Faster air transportation stimulates commerce and business. It creates new patterns of industry by providing closer ties with the large cities and centers of industry. For some communities it has ended relative isolation in a business and social sense. There is little doubt that the local service air carrier is a permanent and integral part of our expanding economy and must and will continue to expand with it. Very few of the communities which have now been given the advantage of air service will willingly be deprived of it. As our population and economy expand and the tempo of our industry is geared more and more to faster and more efficient means of communication and transportation, these carriers will expand and will be required to keep pace with that development.

We have had the opportunity, due to the nature of our association with the industry, to participate and observe at first hand the advancements which the

local service lines have made and to evaluate the underlying problems which must be solved if they are to effectively fulfill their potential in our economy. We have reached the conclusion that permanent certification of these carriers is essential to their continued development for many reasons.

Value of Permanent Certificates

1. Permanent certification will relieve these air carriers of the uncertainty which constantly surrounds their present existence and every decision that they are required to make as to their future. The temporary nature of the certificates of these carriers has been a skeleton in the closet for management and employees alike. It has made it impossible and impractical to plan into the future. Permanent certification will help to relieve the uncertainty on the part of investors, management, and employees.

2. It will relieve management of the tedious and expensive procedures which are required every few years in a certificate renewal proceeding. These proceedings consume too much of the energy and resources of these small companies.

3. It will permit this industry to attract capital which is vital to its expansion and growth. One of the great handicaps of this young industry has been its inability to attract adequate financing due to the temporary nature of its existence. If this industry is to fulfill its vital roll in our economy, it must expand and grow; it must be capable of securing new equipment, and of putting into effect modern procedures which will enable it to keep pace with the times and its competitors.

4. It will reduce employee turn-over and encourage capable people to invest their future in this business. For example, an air line pilot is considered too old for initial employment by most air carriers after age 28. He must, therefore, invest his career with a particular air carrier prior to that age and thereafter remain with it. In making this important decision an individual must have some assurance as to the future possibilities of the Company. The temporary nature of the certificates granted these carriers has been a handicap to them in attracting and maintaining capable personnel.

5. These carriers are badly in need of a more efficient aircraft. This is probably one of the most important technical problems now facing the industry in increasing their productivity and keeping costs under control. New aircraft are expensive to design, construct, and introduce into service. To

How Local Service Can Be Helped and Why It Should Be

LOCAL SERVICE IS IMPORTANT

Because . . .

- It covers a 30,000 mile air network.
- It serves 440 cities, 47 million people.
- It moved 39,620,000 revenue ton miles in 1953.
- Commercial revenue, without mail pay, was $24,300,000 in 1953.

BUT IT NEEDS STABILITY

In order to . . .

- Plan and make decisions for the future.
- Attract capital vital for expansion and growth.
- Encourage capable people to enter the business.
- Attract interest in developing an efficient aircraft.

Which Permanent Certificates Bring

With these added Benefits . . .

- 900 air line pilots constantly available for the National Defense.
- A fleet of 160 aircraft ready in mobilization.
- Assure continued air transport to 264 communities that otherwise wouldn't have it.
- Add to the aviation economy generally.

secure an aircraft adapted to this service, a manufacturer must first see a sufficient market to justify the design and development cost, and these air carriers must be able to secure sufficient financing to acquire the aircraft, introduce them into service, and have a future expectation during which they may be amortized.

Decision up to Congress

It is our belief that the decision on permanent certification of these carriers is one that should properly be made by the Congress rather than the Civil Aeronautics Board. It is our belief that the Congress is requested in this legislation to provide policy-making guidance for one of its agencies, the Civil Aeronautics Board, on the question of the future of this important segment of our air transportation structure. In our opinion, this is properly the function of the Congress and a decision which should be made by it.

Subsidy not Correct Term

Concern is often expressed regarding the so-called subsidy payments which are being made to these air carriers in the present state of their development. We take issue with the term "subsidy" as applied to these payments. It is estimated that such payments to these air carriers this year will approximate $24,000,000. We believe that such payments must be viewed in the overall national interest and as such, an evaluation must be made as to whether there is value being received in the national interest. We contend that these payments represent an excellent investment for several reasons.

1. They are payments not necessarily to the air carriers involved, but payments made to provide essential air service to 440 communities of this country. The payments will be made only so long as they are necessary to develop this air route structure and enable these communities to support this air service without the help of the Federal Government.

2. The national interest is securing a return in the national defense in excess of the total subsidy bill. For example, approximately 900 air line pilots are being maintained, available to the national defense in the highest possible state of proficiency, as transport pilots. Figures recently released by the Defense Department estimate that at present, it costs approximately $120,000 to train a pilot to the minimum proficiency required in order that he may be assigned to a mission. In order for a pilot to be available to the national defense in accordance with the demands of modern warfare, he must be in a constant state of readiness. This can only be achieved by the pilot being constantly in service or constantly in training. The training is very expensive, whether it be given as part of a reserve unit or on active duty with the Air Force. The pilots of these local service carriers are being maintained at a high state of proficiency, constantly available to the national defense of our country, while, at the same time, providing essential air services to the citizens of hundreds of communities. We contend that the value of these pilots to the national defense far exceeds the total so-called subsidy payments that have been made to the local service air carriers from their inception. It is not sound economics to merely take money out of one pocket and put it in another, and if the Federal Government were to terminate the local service air carriers today, we believe that it would be necessary to increase military appropriations by an amount in excess of the total being paid the local service air carriers if the same number of highly trained available pilots were to be maintained.

In addition to the foregoing, we must consider the value to the national defense of the trained mechanics and other highly skilled personnel made available by these carriers.

In the event of the necessity of a rapid mobilization in this country, all of our air transport force would probably be required. These carriers are maintaining approximately 160 aircraft available for essential military or civilian use in such an emergency.

3. The local service carriers have stimulated air travel and served as feeder lines into our larger trunk carriers. In recent years, the growth of air travel combined with increased efficiency has made it possible for most of the trunk carriers to free themselves from a dependence on the Government for so-called subsidy payments. Some of the increase in air traffic must be attributed to the feeder capacity of the local service lines. Undoubtedly this has been a factor in reducing the subsidy requirements of some of the trunk carriers and the so-called subsidy payments have, in effect, been transferred from them to this new development of our air route structure. As our air transport increases these carriers, called at one time feeder lines, will undoubtedly feed more and more passengers into the trunk air carrier systems.

4. It is important to the national interest that local communities develop, maintain, and expand their aviation facilities. The local service industry has stimulated local communities to improve their airports and other aviation facilities. It has provided a source of income that has been of help to communities toward this end and so-called federal subsidy payments have found their way by the medium of the local service carrier to this worthwhile purpose.

Independence Desirable

We concur completely in the desirability of making our entire air transportation free from any dependence upon Government support as rapidly as possible. We believe that this will best be accomplished by the realistic support of these carriers in order that they may expand their service, increase their efficiency, and perform their assigned functions in order that they will grow with our economy. In this light, we view the present so-called subsidy payments as a sound investment in the future.

Will not Hinder CAB

The adoption of this legislation will not preclude the CAB from making essential route adjustments, encouraging consolidations, and so forth, as necessary, to constantly improve the efficiency and economy of our air route structure. In our opinion, the present Civil Aeronautics Act of 1938 provides authority for the Civil Aeronautics Board to take such steps as necessary and the Board has done so with present permanently certificated carriers.

Conclusions

In summation, we believe the adoption of this proposed legislation by the Congress will be in the national interest. It will provide important policy-making guidance for the Civil Aeronautics Board. It will enable the carriers who have been assigned to develop this important segment of our air route structure to better perform their assigned function. It will bring needed stability to these carriers. It will mean added security for the employees and remove the uncertainty that is present when a constant repetition of renewal proceedings and temporary certificates are present. It will enable the industry to attract financing, develop new efficient equipment, and attract capable personnel.

We greatly appreciate the opportunity to appear and make our views known on this important legislation.

ATC: A Look Into the Future

The Traffic Control System must be simplified, says the author, and makes a prediction as to what it may look like in the future as compared to today.

By Sam Saint

Assistant Director, Air Navigation Development Board

The Traffic Control System must be simplified. Air navigation in complex areas like New York must be made easier. Ask any air line pilot, and he will embellish these statements, possibly in unprintable language. When are we going to get relief? This is the question most frequently asked by pilots and controllers alike.

A look at the navigational chart of any congested traffic area, or a look into an Airways Traffic Control Center during peak hour operations is enough to convince anyone that something must change.

Two Birds With One Stone

In order to kill two birds with one stone, I will stick my neck out—way out. I will make a prediction. By describing what I think the Air Navigation and Traffic Control System will look like several years hence, I hope to give you a mental picture of how traffic control could be simplified. At the same time this description of a new system will tell you what sort of things we are pressing for in your behalf.

I realize full well that I am jeopardizing my reputation as an expert. Being an expert in this field I am entitled to sit in endless committees in a happy state of complete frustration. I am sure that my seniority in this category will soon entitle me to an ulcer. I am reluctant to jeopardize these desirable features of my life by making a specific prediction of future things to come. To maintain my status as an expert I should talk all around the subject in high sounding language, seeming to say something but actually saying nothing. Nevertheless, I will try to be as specific as I know how.

The Date: 196?

Captain Joe Blow arrives in Operations, New York. It is 196?. He is to fly TWA Trip 301 to Chicago. The route is clear as far as Cleveland. A squall line crosses the course between Cleveland and Toledo with stratus cloud layers and rain behind the front to Chicago. Chicago is sitting on minimums.

Joe talks with the Dispatcher and files a flight plan; two hours and thirty-five minutes at 20,000 feet. That is his total flight plan. As usual the entire route will be flown on an IFR basis regardless of the weather.

On the Chicago weather sequence a series of numbers advises Joe to expect a 30 minute delay getting into Midway Airport at Chicago. He has a choice. He can take off immediately and take the anticipated delay, IF IT DEVELOPS, by holding or cruising slower en route, or he can take all or part of his anticipated delay by delaying his take-off. Joe elects to take off on schedule and cruise at normal speed as far as Cleveland and then take another reading on the anticipated delay at Chicago.

Dispatch Filing

Dispatch files with the ATC Flow Regulation desk only Joe's expected arrival time at Chicago. This is his arrival time without regard for the delay factor. This original estimated arrival time is the factor that will determine Joe's priority in the approach control system at Chicago on arrival.

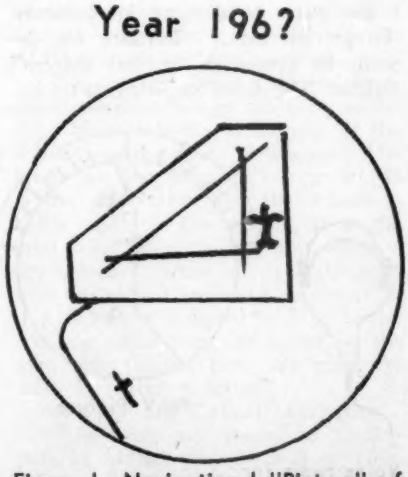

Figure 1—Navigational "Picture" of Departure Route XL-2 with plane on taxiway.

Next we find Joe taxiing away from the gate. He calls the tower and gives Airways Traffic Control the first information regarding his proposed flight. "This is TWA 301 requesting 20,000 feet to Chicago."

The tower advises, "Your departure route will be XL-2. Call when ready for take-off."

Joe's man Friday sets the control head (a gadget like the frequency selector on a VHF Nav equipment) to XL-2. A picture appears on the instrument panel. This picture (See Figure 1), shows the airport with route XL-2 stretching away from the runway on which Joe will take off. The picture is oriented with respect to the airplane's actual position and heading. As Joe moves into position for take-off the navigational picture swings around so the departure route lies ahead of the small airplane painted on the glass of the pictorial navigation instrument. (See Figure 2)

The Takeoff

The tower advises, "Clear for take-off, radar departure." Joe takes off and simply follows the route on the navigational picture.

As seen in Figure 3, there will be a visual clearance indicator with the navigational picture. For the first two or three minutes of flight the clearance indicator will show a red indication, indicating that safe separation from other traffic is being accomplished only by ground surveillance radar. Joe's airplane, of course, carries an airborne radar beacon that responds with a clear indication to the ground radar regardless of rain or other interference. This beacon also will provide the controller with identity on request.

Somewhere between A and B the red light on the clearance indicator changes to green. The climb arrow comes on. And the radar departure controller advises, "TWA 301 continue on signal indications." This does not mean that radar surveilance will be discontinued. Joe's flight will be under radar surveillance throughout the entire flight on

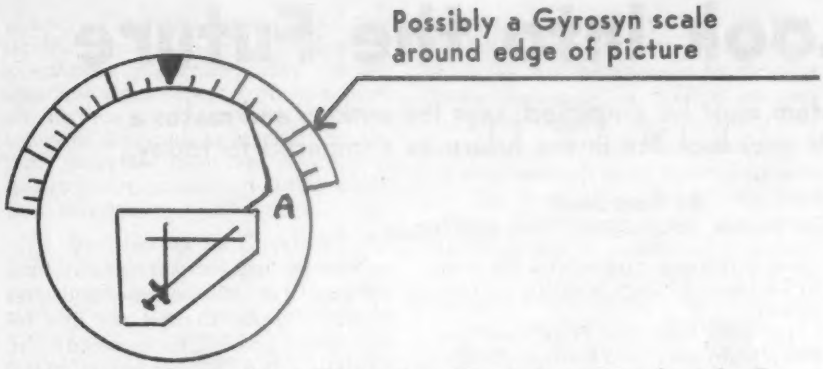

Figure II—Navigational "Picture" as Pilot is in position for takeoff.

this high density route. He will, however, get his clearances through the visual signal indicator except in special cases.

Enroute

The signal clearances can be summarized very simply. As shown in Figure 3 the airplane is approaching B. The green light means the airplane is cleared through B to C. So long as the route remains clear ahead, the green light will remain as the flight passes B. This tells Joe that he is cleared beyond C to D. If the signal changes to red, as the aircraft passes B, this will indicate that there is a flight in the block ahead. When the red light changes to green in the middle of the block, this tells Joe how far ahead the preceding aircraft actually is. A climb arrow with a red light means: "Climb to the next altitude above. Complete the climb before passing the next fix." A climb arrow with a green light means: "Cleared to climb unrestricted."

Flight 301 has progressed without incident as far as Cleveland. Just west of Cleveland the sky gets dark ahead as the flight approaches the squall line. Joe picks up the microphone and, without changing frequency, he says, "This is TWA 301. The sky looks dark ahead. How does it look to you?" He is talking directly to the controller who is responsible for his flight through that area.

The controller looks immediately to the radar scope covering that segment of the route. He notes TWA's position along the route. The controller replies, "TWA 301, suggest you parallel the course 10 miles to the right and move back on course before passing Toledo. This should keep you out of all the storms in this area."

Joe could comply with this navigational direction quite easily because the navigational picture makes it simple to fly a parallel course ten miles to the right. A few minutes later a telephone bell rings behind Joe's head. This is the Dispatch telephone. Joe picks up the phone and Dispatch advises that there is still an anticipated 30 minutes delay in the Chicago area. Joe decides to slow down to kill some of this anticipated time by cruising slower en route. He talks for a moment with the Dispatcher about the trend of weather at his alternate and then hangs up the phone.

Change of Altitude

TWA 301 is flying in a high speed traffic lane at 20,000 feet. Joe knows that when he slows down to 200 miles an hour that he will then be a possible block to high speed traffic behind him. So he calls control to say, "This is TWA 301. We are slowing to 200 miles an hour. Should we descend to a medium speed altitude"

Control replies immediately, "There is a UAL DC-7 behind you. Recommend you descend below 18,000 not later than twenty."

Joe elects to descend immediately. To get his actual clearance for descent he presses a "request descent" button. The down arrow lights up immediately and he starts his descent. As he leaves 19,000 for 18,000 the descent arrow goes out. A few seconds later, without voice request from Joe, the controllers' voice comes on the radio circuit to say, "TWA 301—Descent from 18,000 to 16,000 by radar approved." Joe keeps on descending. As he leaves 18,000 the green light goes to red indicating that his separation from other traffic is based solely on radar. As he leaves 17,000 for 16,000 the green light comes on again indicating that he is back on standard ANC separation.

Route Changes

Passing Goshen, Ind., control advises, "TWA 301—at XL2-T change to route XC-7. Your acceptance time at fix L (the old Lake Shore intersection) will be 15:22." Joe acknowledges the change of route with his flight identity only. No hazard would result in this system if he did not change route as requested.

Joe's co-pilot makes a quick calculation and reports that their estimated arrival at fix L on route XC-7 will be approximately 1525. Joe does not bother to change power.

Approach Landing

As 301 approaches Fix L at 4,000 feet, a jet is heard to report arriving over L at 20,000 feet en route to Chicago Midway. (The jet's signal clearance indicator is inoperative.) Control immediately gives the jet a vector to follow. A minute later Joe arrives over Fix L. Without voice request from Joe control comes on automatically and gives Joe a Vector also.

Joe knows that the Vector he is being given, as well as those being given to the jet are being computed by a special calculator. This calculator knows the time that each aircraft should be over the fence on final approach. The computor also knows the present position and speed of each air-

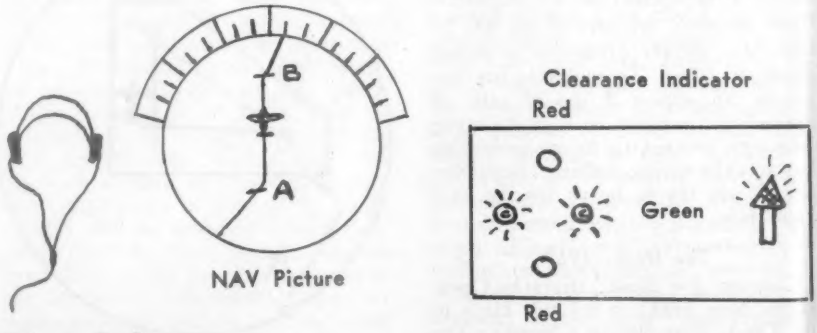

Figure III—Visual clearance indicator with the navigational picture.

craft. The two flying machines are turned into the final approach lane in such a way that Joe finds himself approaching the airport boundary just as the jet is turning off the far end of the runway.

Joe's co-pilot, being new in the business, asks, "How come that animated blow torch was given clearance ahead of us?"

"When there is an anticipated delay," Joe explained, "it is general practice for jet pilots to take their delay (and possibly some additional time to make sure) on the ground at the point of departure. The jet's acceptance time probably rolled around several minutes before he got to the gate. This simply means that when he gets there, he gets t a k e n immediately into the approach system on a first-come-first-served basis."

Obviously, the foregoing description is somewhat simplified for the purpose of easier understanding. It should be interesting to check a few years from now to see how close this prediction has come to the actual system development.

How Not to Get The Answers

Browbeating witnesses defeats its own purpose, Civil Aeronautics Administration accident investigators have been told by an expert.

Dr. Joseph Latimer, University of Oklahoma industrial psychologist, told a class of CAA safety agents that they should "never forget that the witness has the information you want—not vice versa."

Lecturing on "Interrogation of Witnesses," Dr. Joseph Latimer warned against "impertinence" and urged the CAA investigators to "be straightforward—not shrewd or clever."

"While you are making an impression as a clever fellow," he said, "the truth you seek may pass you by."

He pointed to eight ways of twisting a simple question:

"1. Did you see an airplane?
"2. Did you see the airplane?
"3. Didn't you see an airplane?
"4. Didn't you see the airplane?
"5. Was there an airplane?
"6. Wasn't there an airplane?
"7. Was the airplane blue?
"8. Was the airplane blue or black.

Only questions one, two and five are likely to produce a factual answer, Dr. Latimer said.

The Air Safety Forum . . .

(Continued from Page 3)

"to prevent the type of accidents that are occurring over and over again."

"Everything—the plane, the pilot—is certified but airports," he pointed out.

Carl Eck, of ALPA's Engineering Department, stressed the importance of the international influence in air safety.

Regional Activities

In reporting on Regional and Area Safety Committee activities, J. D. Smith, N. Y. Regional Safety Chairman, said great progress had been made.

"The pilot group is in a position to achieve a substantial gain in the level of safety of their operation," he reported. "We have attempted to better coordinate our interests in safety with all other segments of aviation. The basic theme has been to eventually reach the stage whereby all phases of aviation are working toward the same end. This transition period has required quite a bit of time. Actually, we have only scratched the surface of the potential."

The current need, according to Capt. Smith: More pilots actively participating in this part of the safety program.

Special Projects

Capt. R. A. Stone outlined some of the concrete things the work of special ALPA project committees had succeeded in bringing about: Centerline approach lights, for one; safe and sound radar procedures, for another. And in the future: better fire and smoke detectors; a good standardized cockpit—both things on which special ALPA committees are working.

"The one thing that a Special Project Committee brings into any meeting," Stone told the delegates, "is the down-to-earth pilot viewpoint. The pilots are the ultimate consumer! It is the pilot who sees the approach lights under a low ceiling, it is the pilot who is in the hot seat when a fire detector sounds off, it is the pilot who has to live and work in a cockpit that is either designed well or badly. All new ideas must be tested by the man who knows how it's going to work in actual practice."

Air Line and Council Activities

While pilots are needed to participate in special projects and on committees, they can still contribute greatly even without such formal participation, Captain Edwin S. Boyce, pointed out in his report on Central and Council Air Safety Committee activities.

Every pilot, he said, really plays a dual role—pilot and safety man.

"It would be impossible to send along a safety man and a pilot on each flight, so we must incorporate both in the same person."

He urged pilots to pay as much attention to their job of safety man as to their job of pilot. This, he said, can be done by incident reporting.

Commented Capt. Boyce:

"Near misses, errors in navigational aids and equipment, errors in Air Traffic Control, equipment difficulties including the degrees of maintenance and many other important items are constantly being reported, and in most cases pilots will report such difficulties to their respective Safety Chairmen very factually and freely, even when it is possible they may have been in error. This is important, for if we allow some situations to go by unnoticed because of possible pilot incrimination, then we may be suddenly confronted with a serious accident that could have been avoided. We all know that most pilot error is built-in error somewhere along the line, and oftentimes simple changes will add up to the same job being done in a much safer and more efficient manner.

All-Weather Flying

The All-Weather Flying Panel provided an interesting sounding board on a variety of opinions.

Opinion and discussion, taken as a whole, reflected these observations:

- That, despite a high percentage of flight completions, the possibilities of true all-weather flight could be economically attractive.
- That, while the concept of all-weather and "blind" flying has changed radically, instrumentation and aids have lagged behind the concept.
- That aids to all-weather flying will have to come both in the cockpit and on the ground.
- That the first interest in all-weather flight should be safety.

Cutrell: "Aids Inadequate"

Capt. E. A. Cutrell (AA) said that "every air line pilot knows that aids and facilities for weather flying are inadequate for present operating practices and landing minima."

"Such inadequacy," he told the Forum, " is confirmed by looking at the causes of weather accidents during the past year. Many of these accidents have resulted from the failure to provide necessary and required aids that

PILOT TRAINING PANEL: No one questions the need for pilot training. The main problem is: what kind? and how much?

have been developed, perfected and are available.

"Take, for example, the recent approach and landing accident of the Italian airliner at Idlewild. Contributing factors to this accident may have been (1) Insufficient radio and visual approach aids for two-direction landing and (2) Installation of obsolete slope-line approach lights at Idlewild. Some meteorologists estimated the wind at the time of this approach to Runway 4 to be 180° at 40 knots at 1000 ft. altitude. Certainly one of the world's leading airports, Idlewild, should be equipped with a minimum of two complete ILS and approach light systems to preclude ever making a down-wind instrument approach and landing. The slope-line approach lights may have been mistaken by the pilot for runway lights. It is highly important that the center-line high intensity approach light system (standard configuration A) with adequate threshold and runway lights be installed without delay at air line terminals. Each installation should include the condenser discharge lights of the type provided at Newark Airport."

The first safety requirement for visual aids—approach lights, threshhold lights, stop way lights, runway lights or runway markings—is their simplicity of configuration without necessity for pilot interpretation or possibility of pilot confusion.

Hoover: "New Instruments Needed"

Lt. Commander G. W. Hoover, U. S. Navy Office of Naval Research, said he felt all-weather flying was dependent upon completely new instrumentation, a whole new concept for air line cockpits:

"An air line," he said, "can only be as efficient as the pilots who fly its planes and pilots can only be as efficient as their equipment will permit."

He said one evident drawback was instrumentation that spoke in an engineer's terms, factors, instead of the one thing any pilot wants from his instruments, answers.

This, he said, was because engineers think in terms of equations and design accordingly. He advocated:

- Pilots should stop merely accepting, start demanding equipment for their cockpits.
- Pilots must begin to state their requirements in fundamental terms rather than in terms of modifications to existing equipment.
- Air lines should establish a dual program. One to take care of the immediate problems and a companion program to look into the future and to seek ideal cockpits.
- The program must be conducted by a team of pilots, human engineers, engineering physicists, and engineers. The pilots state the data they need, the human engineers establish how the pilots should receive the data, the engineering physicists determine the technical requirements for the controls and display, and the engineers implement the technical requirements. The final conclusions will be made when the pilots determine by test whether the information requirements have been met.
- The cockpit, pilot, instruments, controls, and associated equipment, must be treated as a completely integrated system, each element affecting the design of all other elements.
- Each piece of equipment regardless of how small a part it plays must be designed on the basis of fundamental requirements rather than on personal opinion or the fact that it is a "standard" item.

"If this approach is followed," Commander Hoover said, "there is no reason to doubt that an air line cockpit of the future can be developed which will permit truly all-weather operation because the pilot will be performing at peak efficiency with totally reliable equipment with a minimum of training, and the aircraft will be carrying a maximum payload."

Little: "All-Weather Flying Possible"

David S. Little, Supt. of Airways Aids and Electronics, American Airlines, commented:

"All-weather flight is possible and can be accomplished safely and economically—given a little encouragement and development time."

In addition to electronic and visual aids, he said there were other less discussed, but important factors to be considered. He listed them as:

- The need for sufficient, effective, high speed runway turnoffs.
- The need for airport terminal gate space to effectively utilize the maximum capacity of all-weather runways. Remember those runways are fantastically costly and we can't get two when maybe one could suffice.
- The need for greatly improved means of guiding the aircraft at reasonable taxi speeds from the runway to the gate and vice versa in visibilities so low that ground traffic normally finds it very hazardous to move through such weather.
- The need for clean, smooth, dry runways or perhaps we should say optimum coefficients of runway friction. Reverse props or reverse jet thrust doesn't provide Joe, the pilot, much tranquility of spirit when runways are ice covered, or even just wet.
- The need for greatly improved windshield cleaning, particularly in the moderate to heavy rain condition. Late military jet fighters have very effective windshield cleaning by bleeding hot compressed air across the outside of the windshield.
- The need for aircraft flight instrumentation which will permit the Captain of a 4 to 5 million dollar jet transport to really become master instead of wheelsman of his expensive craft. An autopilot auto-approach equipment cannot do any better on an ILS than the average airline pilot—in fact, it can't do as well. The pilot knows the bends and bumps in localizer and glide slope, disregards them and provides the customers a smoother ride. But this equippage provides the pilot that always essential "time to think"—to be the master instead of the wheelsman. And, last but not least,

let's provide our pilot zeroing instrumentation—the same intelligence we supply the autopilot with which to work.

Taylor: "Radar is Promising"

Speaking for Col. J. Francis Taylor, Jr., (USAF), Director of the Air Navigation Development Board, Sam Saint, Assistant Director, pointed out the desirability of further development of radar.

"Radar," he said, "has advanced the rate of traffic handling in the terminal area more than any other single device.

"Although we have made a significant step forward by using radar in terminal areas as a traffic control aid, I don't think the end of its improvement is in sight. There is still a great deal of expansion left in the system, but in order to get the best out of radar, we must first lick the basic problems that now exist in the radar."

He said there were still drawbacks and that the ANDB type radar safety beacon was presently being evaluated at the Technical Development and Evaluation Center and scheduled for extensive in-service evaluation in the New York-Washington-Norfolk area early next year.

He said his own evaluation of the critical drawbacks of radar were: First, there is a correlation problem existing between the radar scope and the strip postings now used in the centers; Secondly, we do not have a big bright tube display that the controllers can see in a reasonably high ambient light; Third, we still are searching for a method of showing altitude on a radar tube face; Fourth, identification of aircraft is not sufficiently simple to establish, and once established, it is difficult to keep the identity of the aircraft continuously available to the controller; Fifth, radar is still subject to weather in that storms, and some types of precipitation, appear as noise or clutter on the radar scope, making it difficult to track aircraft.

Snodgrass: "Instrument Progress"

R. P. Snodgrass, head, Engineering Dept. for Flight Research of the Sperry Gyroscope Co., said progress was being made towards all-weather flying instrumentation.

"In my opinion," he said, "an 'all-visibility' air line operation can be achieved without incurring a greater risk than is currently accepted, if the following conditions are met:

- Automatic or flight director coupling to the ILS is used.
- The ILS is made more precise, especially the glide slope.

ACCIDENT INVESTIGATION AND PREVENTION PANEL: Accident investigation and prevention is curtailed by outmoded punitive concepts.

- Present accepted high intensity approach and runway lights are installed.
- A "cockpit" weather predicting system is implemented.
- A more precise absolute height indication is provided in the cockpit.
- Flight path control during a go-around can be so precise as to eliminate the present risk associated with the maneuver.

Pilot Training

The session on pilot training brought the warning: "instrument operations with high speed aircraft will demand precision flying, well-trained, coordinated crews, considerably improved aircraft, instruments, accessories, navigational and communications aids."

Gates: "Training Desirable"

This was the opinion of Robert F. Gates, Chief, Special Operations branch of the Civil Aeronautics Administration, who left this conclusion with those in attendance at the Forum:

"The present air line pilot training program requirements are generally satisfactory. Additional recurrent flight training is desirable due to the increasing complexity of aircraft and aircraft equipment; however, flight simulators can probably meet the need for increased flight time. Numerous procedural items might be eliminated from flight training and accomplished in simulators to permit use of flight time for improving pilot abilities to handle high-performance aircraft under both normal and emergency conditions. Today, training in emergency procedures is the cornerstone of safety and as basic to modern air transportation as needle, ball, and airspeed were to the pioneer instrument pilot. Flight crews of future aircraft will be no less important than in today's operation, even though numerous flight functions are performed automatically.

Mouden: "Make Training Palatable"

Captain Homer Mouden, Braniff Airways, said the greatest needs in pilot training were:

- A means of making pilot training more palatable to the pilots.
- A means of presenting the limitations of the tool in the most concise and graphic manner possible, so that pilots will retain it.
- More practical training in those phases of a pilot's work which cannot normally be practiced in scheduled air line flying, without his being "checked" on the very training.
- Means of impressing upon all pilots the acute need for standardized procedures, and for him to constantly follow these procedures.

Moss: "An Integral Part of Safety"

Capt. W. W. Moss, Assistant Chief Pilot, Training, PAA Atlantic Division, called training "an integral part of operations and safety."

"It is obvious that constant training and checking in both old and new procedures is one of the cornerstones of flight safety," he declared.

"It is important, however, to put training and checking in the proper perspective. When discussing pilot proficiency programs you often find a tendency to lump them together, and to assume that training is being given a check ride or, conversely, that a check on a man's ability is being obtained during a training period. To a very limited degree this is true, but I feel very strongly that it should be realized that there are separate and distinct requirements for both training and checking and that these requirements can best be satisfied by separate treat-

ment within the framework of an overall program, both ground and flight, dedicated to the attainment and maintenance of pilot proficiency adequate for the safe and efficient operation of the particular air line, and secondarily to the gradual raising of the level of competency in order to permit more efficient operation of present equipment and to be ready for the transition to future aircraft."

Brush: "The Only Means"

Robert P. Brush, Douglas Aircraft Co., maintained: "Continued training provides the only means whereby the Captain and his crew can be kept up to date on the safest and most efficient way to operate the particular type of equipment they fly."

Accident Prevention

In the discussions of accident prevention and investigation there were definite conclusions that there was room for improvement.

It was brought out:

- That a foresighted preventative program is preferable to the accident investigation type where we learn by hindsight.
- Nevertheless, we should not fail to apply to future accidents prevention knowledge gained from past ones.
- Accident investigation and prevention will be curtailed as long as we have punitive legal and regulatory concepts.
- Despite any program, there will still be some accidents and we should design for survival in these.

Smith: "Probe and Act"

Capt. J. D. Smith, Chairman of the Panel, said that accident investigation, properly conducted, may well be a very beneficial factor to the pilot group.

"In order to gain maximum benefits from accident investigation, it is necessary to determine all related factors and then establish why it occurred."

He classified accident investigation as a "defensive program" and education at the other guy's expense.

"An accident prevention program is preferable," he said, "and very desirable from everyone's standpoint. No one wants accidents of any form in aviation; however, a continuous accident-free operation takes much more than just hoping. In order to have continuous accident-free operation, it is necessary to blend many factors."

Outstanding among these factors, he said, were:

- Understanding and appreciation of a potential or existing problem.
- An honest approach to solving it.
- When it appears a solution is available, it should be expedited as rapidly as possible.

Lederer: "Revise Our Concept"

Jerome Lederer, Director of Flight Safety Foundation, said an effective accident investigation and prevention program would ideally include personal incident reporting, mechanical incident reporting by flight recorders, and much more freely revealed accident investigation.

But what stands in the way of the effectiveness of such a program is punitive concepts breeding reluctance in the case of incident reporting and flight recorders, and, in the case of accident investigations, the threat of legal repercussions.

Mr. Lederer suggested: "If no solution to the punitive aspects of incident reporting is in sight, perhaps a small group could be formed to delve into this problem immediately to determine a suitable cause of action satisfactory to all."

He said flight recorders were advocated only "if not used as mechanical spies or as a basis for punitive measures." One possible solution: some method by which pilot identification would not be possible.

On accident investigation, he commented: "some changes in procedure appear desirable because the specter of the law interferes."

"In the absence of a good incident reporting system, and even if it existed, we must still learn as much as possible from accident investigations. It seems ridiculous that pilots are compelled to resort to the Fifth Amendment of the Constitution to protect themselves after giving testimony at an accident investigation, or that they should seek legal assistance prior to giving their testimony.

"No one should question the need to protect the interests of those who suffer from an accident but some way should also be found to protect the interests of the traveling public from the threat of a legal system which permits a lawyer to use safety information to advance the interests of a client and thus paradoxically thwart freedom in developing safety information."

The Cover

Turbo-props drew considerable interest at this year's Forum. Looking over the Viscount engine (l. to r.) are President C. N. Sayen, Capt. Peter Bressey, British European Airways; Capt. R. A. Stone, UAL; and Capt. Henry Weigel, Capital Airlines.

Andrews: "Casual Factors Important"

W. K. Andrews, Director, Bureau of Safety Investigation, CAB, told the Forum that the agency was now paying more attention to casual factors in accidents.

"In many cases, the distinction between so-called primary and secondary causes has been somewhat arbitrary; in other words, they were so closely linked that the distinction had to be a very fine one. Consequently, we have studied the problem very carefully to resolve this. Our motivating purpose in this study was to determine the answer from the standpoint of developing all possible accident prevention information, and I believe we have succeeded. All casual factors are considered on equal terms, and are now so published. In the Board's report on Accidents in U. S. Scheduled Passenger Operations for 1952 and 1953, this procedure was followed.

"Coincidental with this, any reference to the term 'pilot error' has been discontinued in our published statistics. Unquestionably, erroneous implications were created by the use of this term. What we do now is simply state the facts—the actions—under the respective headings, be it pilot, powerplant, weather, or any other casual factor.

"To illustrate the point, there are several factors in practically all accidents; for example, weather, powerplant, runway, and pilot may all be involved in a single accident."

Hasbrook: "Design for Survival"

Prevention measures to the contrary, some accidents will occur, said A. Howard Hasbrook, Associate Director, Aviation Crash Injury Research, Cornell University.

It is to take care of these, that we should design for survival, he said.

He recommended:

- Delethalize all interior cabin components which can be struck by passengers.
- Moderate the death-dealing potentials of the cockpit which does not lend itself to delethalization.

For pilot survival he recommended: (1) Shoulder harnesses in addition to safety belt; (2) light weight crash helmets.

This is how he summed it up:

"Although the fatality rate per passenger mile can be expected to decrease —through accident prevention work— accidents will occur.

"Some of these accidents will be of a survivable type.

"Death or survival for passengers and crew in these survivable accidents will depend, in a large part, on whether crash-survival design factors are integrated in the basic design of future aircraft.

"To achieve such integration of design, it will be necessary for all safety segments of interested government agencies, airframe and seat manufacturers, the airlines, and crew member organizations to work together.

"To provide the data necessary for crash-survival design, the continued investigation, analysis, and reporting of crash-injury details of survivable accidents must be supported.

"Other allied research work on problems affecting survival design, such as that conducted by the CAA at Indianapolis, and the NACA, must also be supported."

Turbo-Prop Operations

Going into turbo-prop transport operational problems, the Forum heard from a Capital Airlines pilot who will soon be flying them, a British pilot who has been flying them, a governmental official active in their certification, and a manufacturer who is designing and building them.

They left this picture with the Forum:

- Performance-wise, pilots should be happy with the turbo props.
- Pilots should not experience too much difficulty in transition from piston to turbo engines.
- Turbo props differ operationally in two very definite ways: they're not as rugged, requiring better ground handling; they're fuel eaters with big appetites, making flight planning extremely important.
- Some new policies must be formulated governing their airworthiness aspects.

Bressey: "Two Important Factors"

For probably the first time in the U. S., the operational and pilot viewpoint of turbo-props was made available by a man with actual line operating experience on turbo-props.

That man was Captain Peter E. Bressey, British European Airways. The plane: the Viscount.

The Viscount, he said, is not the perfect plane because there really is no such animal, but it is a big step in that direction. It has its own peculiar problems, he pointed out, but they are being overcome and performance-wise it's a great plane.

TURBO-PROP OPERATIONS PANEL: The new planes will bring some new problems, but along with them many advantages as well.

Speaking as a pilot to pilots, he said he does not believe there are any great difficulties involved in making the transition from piston engine to turbo-prop, "provided that two very important operational factors are appreciated right from the start."

"The first is that the turbo-prop is a little more sensitive, and needs rather more care, particularly in the ground handling, than most of the older and more rugged types of piston engine that many of us have used in the past. I think this point can best be covered by really thorough instruction during the ground technical course on the power plant.

"The second point is that fuel consumption is, on the average, about twice that of a piston engine of comparable power, and that this average is itself the mean of a somewhat large range of consumption, varying almost linearly according to altitude. Briefly, the answer to this point is both short and sweet: 'When in doubt—stay up!' "

He was enthusiastic about the Viscount's engine-out performance, commenting:

"Here the turbo-prop really scores over the piston engine. You have no problems of greater induced drag due to large cowl openings being necessary in the engine-out configuration, as there are no cowls to open! No worries about cylinder-head temperatures going up due to lower airspeed. And in most cases, not even any worries due to taking a bit too much power for comfort out of the remaining engines. If cruising when the engine loss occurs, you have, of course, to initiate a drift-down to the three-engine cruising altitude, normally about 75% of your four-engined altitude. Unless the aircraft is still nearly up to maximum weight, it is not necessary to alter the engine settings—13,600 rpm on three engines at the lower altitude is normally sufficient. Of course the air-miles-per gallon suffer, and you must reconsider your flight plan accordingly."

Weigel: "Many Advantages"

Captain Henry S. Weigel, Capital Airlines, discussed what he had learned about turbo-props while flying Viscounts from the viewpoint of a piston-engine pilot.

He said he thought the advantages outweighed the disadvantages. Some of the advantages he found: (1) Simplicity of operations, especially when automatic fuel trimming comes into use; (2) Full take-off power available, except for field elevation, regardless of temperature or humidity; (3) 100% temperature accountability past all obstructions on take-off; (4) The reduced fire hazard due to the use of kerosene; (5) Propeller feathering features; and (6) Reduced pilot fatigue due to less vibration.

One apparent disadvantage: the rate of fuel consumption and all of the problems connected with it. Captain Weigel's conclusion: The airplane is essentially no different from any other and the engine probably will, after a period of familiarization, give more trouble free service than any piston.

Maloy: "Some New Problems"

Raymond B. Maloy, Chief Flight Test Branch, U. S. Dept. of Commerce, discussed turbo-prop certification problems from a flight standpoint.

"The fundamental differences be-

Capt. Peter Bressey
British European Airways

C. N. Sayen
President, ALPA

F. B. Lee
Administrator of Civil Aeronautics

W. K. Andrews
Chief, Bureau Safety Investigation, CAB

Safety Forum Banquet Speakers

Approximately 150 people attended the banquet held the night of March 9 in the Louis Fourteenth Room of the Shoreland. Pictured on this page are the banquet speakers.

Jerome Lederer
Director, Flight Safety Foundation

Capt. R. A. Stone
Special ALPA Committee Chairman

G. W. Taylor
Boeing Aircraft Co.

Frank Entwistle
Chief, Flight Branch, ICAO

tween a turbo-prop and reciprocating engine plane," he said, "can be summed up in the greater speed/height operating regime and the different thrust and drag characteristics of the power plant. These differences give rise to associated problems in other areas, such as cabin pressurization, power plant controls, etc.; and of course many of these problems must be met by the formulation of appropriate policies governing their airworthiness aspects."

He outlined the direction of CAA's efforts in the flight test area in respect to future transports.

"At the present time," he told the Forum, "we are conducting a detailed study of braking force coefficients in the light of a large number of variables, such as wet and icy runway surfaces, wind, gradient, tire pressures, pitch and thrust reversing devices, and the like. Our objective is to come up with a more realistic basis for field length requirements. In addition to this important study, we have been engaged, in cooperation with the manufacturing and operating industry and yourselves, in the continuous evaluation of the statistical approach to the development of performance standards for large airplanes. I feel confident that the prosecution of this program, without prejudice or prejudgment, will lead to the acceptance of an even sounder set of airworthiness and operating standards than we enjoy today."

Ready: "An Important Role"

J. T. Ready, Jr., Project Engineer for Consolidated Vultee, spoke from the manufacturer's standpoint.

He said Convair believes that turbo-prop aircraft will play a most important role in the future of air transportation. "The step," he pointed out, "is not only logical but fills the important need for a medium range economical power plant for air transport. It is Convair's further belief that turbo-prop aircraft will be more efficient for short and medium range distances than turbo-jet transports. The cruising speed advantage of turbo-jet planes is outweighed by the turbo-prop's shorter field lengths and its saving in fuel costs, an economic advantage which will make the turbo-prop a key factor in air line plans for future equipment.

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The Forum Banquet

The Banquet was held Wednesday evening. Captain R. A. Stone, UAL, served as M.C., introducing the speakers who were: C. N. Sayen, President, ALPA; Peter Bressey, British European Airways; Frank Entwistle, Chief, Flight Branch, ICAO; W. K. Andrews, Chief, Bureau of Safety Investigation, CAB; F. B. Lee, CAA Administrator. Principal speaker: G. W. Taylor, Boeing, who spoke on "Boeing 707 Progress." Flight Safety Foundation Director Jerome Lederer presented a special citation on behalf of the Flight Safety Foundation to the crew of the UAL plane which crashed near Moline, Ill. on January 19.

Among Those Present

Present at the Forum were:

Central Airlines Safety Chairmen: Charles Daudt (AA); D. N. Kimmel (ALG), Hugh Wallace (BAL), Warren Hitt (BNF), Henry Weigel (CAP)*, L. M. De LaRosa (CARIB), E. W. Garges (CAI), B. C. Dickerson (D-C&S), Jeff Hanan (SWA), Robert Thomas (TPA—Proxy), Sidney Simms (TTA—Proxy), Edwin Boyce (TWA)*, E. J. Kelly (UAL—Proxy), F. R. McDonald (WCA), G. M. Sheridan (EAL), Robert E. Wells (FAL—Proxy), W. Leo Rankin (HAL—Proxy), Edward Taaffe (NAL), Ralph Parkinson (NOR), W. R. Waters (NEA—Proxy), Lloyd Milner (NWA), Norman Seebach (MOH—Proxy), Al Waltz (OZA), L. N. Jack, (PAA), F. E. Nelson (PGA), S. P. Gilley (PIED), Harold B. Hall (PAL), Carlton Smith (RAL), Tripp Brown (SOU).

Regional, Sub-Regional, and Special Committee Chairmen: J. D. Smith (CAP)*, R. A. Stone (UAL)*, L. Homer Mouden (BNF)*, E. A. Cutrell (AA)*, Don Hurst (BNF), E. H. Croft (BNF), Don Leonard (NWA), Mel Logan (AA), Henry P. Rosasco (EAL), George Drew (TWA), A. L. Headstrom (TWA), M. A. Ferguson (FAL), C. Gilbert Sperry (UAL), Jimmie Singleton (EAL), Harold Miller (AA), James Elrod (LCA), R. D. Potter (D-C&S), W. L. Collier (PAA), Ben Busse (EAL), Barton Hewitt (TWA).

Pilot Guests: Jess Henslee (AA), Jack Lovett (NWA), Bill Atkins (NWA), J. S. Grier (EAL), R. W. Calkins (AA), S. J. Devine (UAL), R. Becker (CAP), L. J. Danielsen (TWA), and Harry Orlady (UAL).

Special Pilot Guests: Earl Andreasen and Thomas Boyle, (UAL), and Patricia Johnson, (UAL).

Industry Guests: Al Salmon, United Air Lines; K. L. Burroughs, The Aeronautical University; E. C. Sutton, Aero Associates; John Quinn, CAB; Al Koch, CAA; F. B. Lee, CAA Administrator; E. B. Franklin, CAA; Ferris Howland, Chief Airport Traffic Controller, CAA; W. H. Weeks, CAA; Gordon Conley, Aviation Week; R. Dixon Speas, Aviation Consultant; Carl F. Schmidt, Lockheed; Howard Warryn, National Safety Council; W. W. Braznell, American Airlines; J. D. Alexander, Trans-Canada Airlines, Frank Entwistle, ICAO; G. W. Holdman, CAA; M. B. Spaulding, Jr., Consulting Engineer; J. J. Ryan, General Mills Co.; A. E. Abney, Dept. of Aeronautics, Springfield, Ill.; T. L. K. Smull, NACA; Robert David, USAF; A. J. Johnson, USAF; Ben Ashmead, Bureau of Safety Regulation, CAB; D. M. Stuart, CAA; L. M. Tannenbaum, USAF; F. E. Davis, EAL; Wayne Jordan, CAA; John Sendow, UAL; Howard J. Reid, Capital Airlines; Dennis Jackson, Rolls Royce of Canada; Sam Davis, American Airlines; Wayne Hendershot, CAA; David Proudlove, British Embassy; Leonard Smith, National Safety Council; W. W. Moss*, Pan American Airways; Robert F. Gates*, CAA; Robert Brush*, Douglas Aircraft Company; David S. Little*, American Airlines; LCDR G. W. Hoover*, USN; Reuben Snodgrass*, Sperry Gyroscope Company; Sam Saint*, Air Navigation Development Board; W. K. Andrews*, CAB; Jerome Lederer*, Flight Safety Foundation; A. H. Hasbrook*, Aviation Crash Injury Research; Peter Bressey*, British European Airways; Ray Maloy*, CAA; J. T. Ready, Jr.*, Convair; G. W. Taylor, (Banquet Speaker), Boeing Aircraft Company; Francis P. Torino, ACFEA; J. V. Manning, ACFEA; Bill Sawvel, ACFEA; Russ Laugaugh, CAA; J. C. Lewis, USAF; W. S. Davis, USAF; Capt. Lanzlinger, Swissair; Capt. Bill, Swissair; Paul W. Luthi, Swissair; J. Brehl, Toronto STAR; Joseph Duckworth, Link Aviation; H. W. McClellan, USAF; D. H. Scott, Convair; R. H. Carpenter, Flight Safety Foundation; W. F. Chana, Convair; Peter Reich, Chicago American; J. F. Woodall, Convair; H. A. Wolf, Bendix Radio Corporation; James Graham, U. S. Aviation Underwriters; and Miss Mel Sokol, American Aviation Magazine.

*Panel Member.

More Detailed Reports

This article has, of necessity, been only a condensation of subject matter and a running report of what went on at the Forum day by day. Subsequent articles in The Air Line Pilot, based on the Forum papers and discussions, will treat on the individual subjects in greater technical detail.

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Dept. AP4, 209 S. State St., Chicago 4, Ill.

At the Third ALPA Air Safety Forum . . .

Award

Jerome Lederer (left) presenting citations to Thomas D. Boyle (right), Patricia Johnson, and Capt. E. W. Andreasen.

Field Trip

The Dehmel Trainer is Demonstrated. (L. to R.) B. C. Dickerson, D-C&S, Mel Logan, AA, Jack Lovett, NWA, and UAL'S instructor.

Discussion

(L. to R.) First V.P. C. E. Beatley, ALPA President C. N. Sayen, LCDR G. W. Hoover, USN, Region V Vice President C. A. Peternell, and W. W. Braznell, Director of Flying Operations, American Airlines.